

REMARKS

As a preliminary, Applicants and Applicants' representative thank the Examiner for the personal interview which was held on June 20, 2006.

By the present amendment, claim 22 has been amended to recite that the polarizer consists of a hydrophilic film.

Also, new claim 53 has been added. Claim 53 depends on claim 22 and recites that the polarizer is an iodine-based polarizer that is dyed with iodine.

Support for the added recitations is found in the original application, in particular in the Examples.

Claims 1-18, 21-35, 42-51, and 53 are pending in the present application. Claims 1, 8, 22, and 42 are the only independent claims.

A Corrected Declaration under 37 C.F.R. 1.132 by Mr. Sugino is submitted with this paper to correct an obvious error in the Declaration under 37 C.F.R. 1.132 filed on February 27, 2006, in that the material for the experimental polarizers was polyvinyl alcohol, a hydrophilic material, and not polyvinyl acetate, a hydrophobic material. The Corrected Declaration is identical to the Declaration filed February 27, 2006 except that the word "polyvinyl acetate" has been replaced by "polyvinyl alcohol."

Applicants apologize for the error in the Declaration. It is submitted that the Corrected Declaration appropriately clarifies that the experiments in the Declaration concerned PVA polarizers obtained by a dry-stretching method.

Thus, the Corrected Declaration is submitted to show that a manufacturing process of a polarizer (PVA polarizer) by dry-stretching is conducive to a high shrinkage force of at least about

5 N/cm (when measured in accordance with the measurement protocol for comparison with the present invention, i.e., after heating at 80°C for 30 minutes).

Further, a Supplemental Declaration under 37 C.F.R. 1.132 by Mr. Sugino is also submitted with this paper. The Supplemental Declaration reports on experiments conducted (i) to show that the stretching ratio or dimensional change rate (which is a ratio of dimensions, appropriately indicated as a percentage) is not correlated to the shrinkage force (which is a force, appropriately measured in N/cm) and (ii) to provide additional evidence that a manufacturing process by dry-stretching is conducive to a high shrinkage force, and in particular the fact that the lower the dry-stretching temperature in the manufacturing process, the higher the shrinkage force.

The experimental results in the Supplemental Declaration will be discussed in details in traverse of the art rejections below.

In the Office Action, claim 22 is rejected under 35 U.S.C. 102(b) as anticipated by US 5,286,418 to Nakamura et al. ("Nakamura").

The rejection is respectfully traversed. Nakamura is completely silent regarding a polarizer consisting of a hydrophilic film having a shrinkage force of at most 4.0 N/cm (when measured in accordance with measuring protocol recited in claim 22). Specifically, Nakamura discloses a hydrophobic film, not a hydrophilic film, so that Nakamura does not provide any guidance regarding properties or manufacture of a polarizer comprising a hydrophilic film.

In addition, Nakamura is completely silent as to a shrinkage force of its polarizer. The polarizer of Nakamura is obtained by dry-stretching. As illustrated in the Supplemental Declaration by Mr. Sugino, a dry-stretching process results in a high shrinkage force. Also, as shown in the Supplemental Declaration, a low dimensional change ratio cannot be correlated to the

shrinkage force, so that there is no indication that the polarizer of Nakamura has a shrinkage force of at most 4.0 N/cm, as explained in more details below.

Specifically, the assertion in the Office Action that, in the Declaration, the shrinkage force is measured at 105°C and not 80°C as claimed, is respectfully traversed as incorrect. As discussed at the interview, 105°C is the temperature of the rollers at the time of manufacturing the polarizer (see paragraph 6 of the Corrected Declaration). On the contrary, the Declaration states explicitly that the shrinkage force was measured at 80°C (see paragraph 8 of the Corrected Declaration). Thus, 105°C was the dry-stretching temperature in the manufacturing method of the experimental polarizer of the Declaration, whereas 80°C was the heating temperature for complying with the shrinkage force measurement protocol so as to make a proper comparison with a polarizer of the present invention.

In addition, the Supplemental Declaration shows that a dry-stretching manufacturing process performed at a lower temperature results in a higher shrinkage force. Specifically, in the experiment reported in the Supplemental Declaration, a dry stretching manufacturing process at 105°C resulted in a polarizer having a stretching force of 6.77 N/cm, whereas a dry-stretching manufacturing process at 95°C resulted in a polarizer having a stretching force of 8.54 N/cm (see the two last rows of the Table in paragraph 12 of the Supplemental Declaration). Accordingly, a polarizer obtained by dry-stretching at 80°C, as in Nakamura, could be expected to have a particularly high shrinkage force.

In this respect, the assertion in the Office Action that, in the Declaration, the shrinkage force decreases with time and is under 4 N/cm for less than 20 minutes, and Nakamura dries its film for only 3 minutes, is respectfully traversed as erroneous. The appropriate measurement

protocol requires that the stretching force must be measured after heating for 30 minutes. The duration of any manufacturing step for manufacturing the polarizer, and/or a stretching force after heating for any duration of 20 minutes, is not relevant for the measurement of shrinkage force. In other words, the fact that the manufacturing process of Nakamura may use a drying step of a relatively short duration does not provide an indication as to whether the resulting polarizer would have a high or low shrinkage force (measured after heating at 80°C for 30 minutes). This is illustrated both in the Corrected Declaration and in the Supplemental Declaration, which test a variety of dry-stretching production processes that were found to result systematically in polarizer having a shrinkage force considerably higher than 4.0 N/cm (see the graph in paragraph 7 of the Corrected Declaration, and the three last rows in the Table in paragraph 12 of the Supplemental Declaration).

In addition, the assertion in the Office Action, that Nakamura teaches a shrinkage ratio no greater than 1% after heating at 80°C in Example 2, which meets the claimed range of “at most 4”, is respectfully traversed as not relevant. The stretching ratio or dimensional change rate (which is a ratio of dimensions, appropriately indicated as a percentage) is not correlated to the shrinkage force (which is a force, appropriately measured in N/cm). In other words, a stretched film can have a low dimensional change, i.e., maintain relatively stable dimensions, but still exhibit high shrinkage force, i.e., be subjected to internal forces. The lack of correlation between the dimensional change rate and the shrinkage force is demonstrated in the Supplemental Declaration, in which various stretched polarizing films resulted in a practically random distribution in a graph [dimensional change rate X shrinkage force] (see the Table and Graph in paragraph 8 of the Supplemental Declaration). In particular, it is immediate from these experimental results that a

reduction of dimensional change ratio does not necessarily result in a low shrinkage force, and especially not for polarizers obtained by dry-stretching (as shown when considering the shrinkage force values from the left toward the right side of the Graph in paragraph 8 of the Supplemental Declaration).

Indeed, it is submitted that an important contribution of the present invention is the recognition that, irrespective of the dimensional stability of a polarizer, some deteriorations of optical properties of a polarizer are linked to internal stresses (identified by the shrinkage force). For example, these stresses may have been caused by the manufacturing process. In this respect, the Supplemental Declaration by Mr. Sugino illustrates both (i) the lack of correlation between shrinkage ratio (i.e., dimensional change rate) and shrinkage force (i.e., a force or stress), and (ii) the fact that dry-stretching manufacturing, irrespective of dimensional stability, is conducive to high internal stresses, i.e., a high shrinkage force.

In summary, the features of the polarizer according to present claim 22, wherein the polarizer consists of a single layer hydrophilic film having a shrinkage force of at most 4.0 N/cm in an absorption axis direction, the shrinkage force being measured by (i) heating the polarizer at 80°C for 30 minutes, and (ii) subsequently measuring the shrinkage force of the polarizer alone, as recited in present claim 22, are not taught or suggested in Nakamura. Therefore, claim 22 is not anticipated by, and not obvious over, Nakamura.

In view of the above, it is submitted that the rejection should be withdrawn.

Further, with respect to new claim 53, it is submitted that the hydrophobic film of Nakamura cannot be dyed with iodine, because it is well known that such a hydrophobic film is resistant to a colorant. Therefore, for this reason, claim 53 is not anticipated by, and not obvious

over, Nakamura.

Next, in the Office Action, claims 1-2, 5-6, 21-22, 35, and 42-49 are rejected under 35 U.S.C. 102(b) as anticipated by US 4,818,624 to Downey, Jr. ("Downey"), claims 3-4 are rejected under 35 U.S.C. 103(a) as obvious over Downey, claim 7 is rejected under 35 U.S.C. 103(a) as obvious over Downey in view of US 6,065,457 to Aminaka ("Aminaka"), claims 8-16, 23-28, 42-47, and 50-51 are also rejected under 35 U.S.C. 103(a) as obvious over Downey in view of Aminaka, and claims 17-18 and 29-34 are rejected under 35 U.S.C. 103(a) as obvious over Downey in view of Aminaka and further in view of US 6,361,838 to Miyatake et al. ("Miyatake").

The rejections are respectfully traversed. A polarizer obtained by dry-stretching, as in Downey, is expected to have a shrinkage force considerably above 4.0 N/cm. Specifically, the Corrected Declaration provides evidence that a PVA polarizer obtained by dry-stretching, as in Downey, has a shrinkage force of at least about 5.0 N/cm, and the Supplemental Declaration confirms with multiple dry-stretching experiments that a dry-stretching process of a hydrophilic film results in a high shrinkage force (see the three last lines of the Table in paragraph 12 in the Supplemental Declaration).

Also, the Supplemental Declaration shows that a low dimensional change ratio cannot be correlated to the shrinkage force (see the Table and Graph in paragraph 8). In particular, it is immediate from these experimental results that a reduction of dimensional change ratio does not necessarily result in a low shrinkage force, and especially not for polarizers obtained by dry-stretching (as shown when considering the shrinkage force values from the left toward the right side of the Graph in paragraph 8 of the Supplemental Declaration). As a result, even if there were a suggestion that the polarizer of Downey has a low dimensional change (which Applicants

deny, because Downey attaches its polarizer to a thick substrate in order to limit dimensional change), the shrinkage force in the polarizer of Downey is still expected to be considerably above 4.0 N/cm.

In particular, as set forth in the response of December 27, 2005, Downey does not indicate an “insubstantial amount” of shrinkage but “slight shrinking” for its inventive polarizer samples, as opposed to “severe shrinking” for the comparative samples. Since the samples of Downey consist of a laminate of the polarizing film with a polyester or PET substrate, there is a strong suggestion that Downey obtains a polarizer having a high shrinkage force, when the shrinkage force is measured on the polarizer alone.

Again, it is submitted that an important contribution of the present invention is the recognition that, irrespective of the dimensional stability of a polarizer, some deteriorations of optical properties of a polarizer are linked to internal stresses (identified by the shrinkage force), for example, caused by the manufacturing process. The Supplemental Declaration by Mr. Sugino illustrates both (i) the lack of correlation between shrinkage ratio (i.e., dimensional change rate) and shrinkage force (i.e., a force or stress), and (ii) the fact that dry-stretching manufacturing, irrespective of dimensional stability, is conducive to high internal stresses, i.e., a high shrinkage force. Therefore, there is overwhelming evidence that the polarizer of Downey, which is obtained by dry-stretching and is not even indicated to have a low dimensional change unless it is stuck on its substrate, has a shrinkage force considerably higher than 4.0 N/cm.

Finally, regarding the silylation treatment of Downey, it is submitted that such silylation treatment has a limited effect, as it is applied on at most a very thin surface zone of the polarizer (in the order of the nm). As a result, the silylation treatment cannot be expected to affect substantially

the shrinkage force of a polarizer having a thickness usually in the order of at least several μm or tens of μm .

In summary, Downey fails to teach or suggest the features of a stretched hydrophilic polymer film, wherein the polarizer has a shrinkage force of at most 4.0 N/cm in an absorption axis direction, the shrinkage force being measured by (i) heating the polarizer at 80°C for 30 minutes, and (ii) subsequently measuring the shrinkage force of the polarizer alone, as recited in present claims 1, 8, 42. Further, the other cited references fail to remedy the deficiencies of Downey. Therefore, present claims 1, 8, and 42, and the claims dependent directly or indirectly thereon, are not obvious over Downey and the other cited references, taken alone or in any combination.

In addition, with respect to the dependent claims, it is submitted that the cited references fail to teach or suggest the combinations of features in these respective claims. In particular, with respect to claims 48-51, it is submitted that Downey considers the dimensional variation of a polarizer after silylation treatment and attachment to a substrate, so that it is completely silent as to polarizer formed with a dyed and stretched hydrophilic polymer monolayer film, let alone when the polarizer consists of the stretched hydrophilic polymer film. Therefore, for these respective reasons alone, the respective dependent claims, and in particular claims 48-51, are not obvious over Downey and the other cited references, taken alone or in any combination.

In view of the above, it is submitted that the rejections should be withdrawn.

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

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In the event there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to our Deposit Account No. 50-2866.

Respectfully submitted,

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